

# BMF CLASS D AMPLIFIERS

## FEATURES

- Class "D" Technology
- Fully 1 Ohm Stable Operation
- Military Spec Audiophile Grade Components
- High Efficiency PWM Power Supply
  - Multi-stranded power torroid
  - Oversized torroidial core
- MOSFET Input and Output Transistors
- Oversized Capacitor Banks
- Discrete Mount Power and Speaker Terminals
- Variable Lowpass Electronic Crossover
- Variable Subsonic Filter
- RCA Preamp Output
  - Variable HP/LP/Full crossover
- Built in Bridging Module
  - Master / Slave Selector
  - 0/180 Phase Selector
- 5 Way Protection Circuitry
- Soft Remote On/Off Circuitry
- Digital Subwoofer Level Control
- Two Year Limited Warranty

## SPECIFICATIONS

MODEL:	BMF1000D	BMF600D
RMS Power / 4 ohms @ 0.08% T.H.D.	250W x 1	150W x 1
2 ohms @ 0.4% T.H.D.	500W x 1	300W x 1
1 ohm @ 1 % T.H.D.	1000W x 1	600W x 1
Efficiency / Typical	86%	86%
Worst Case	72%	72%
Bandwidth +3dB	10Hz – 250Hz	10Hz – 250Hz
Signal To Noise	>90dB	>90dB
Damping Factor	200	200
Input Sensitivity	240 mV – 6V	240mV – 6V
Input Impedance	20K ohms	20k ohms
Circuit Breaker / fuse	120 Amp	60 Am p
Dimensions	9.3"W x 2.1"H x 13"L	9.3"W x 2.1"H x 10.5"L
CROSSOVER		
Low Pass	Variable 50 – 250Hz	
X-Over Slope	12dB	
Variable Subsonic Filter	Variable 20 - 50Hz @ 12dB	
Preamp Crossover	Variable 50 – 250Hz	
Preamp output		

All specifications are with 12.5 volts DC. Typical output with 14.4 volts DC is 20% higher.

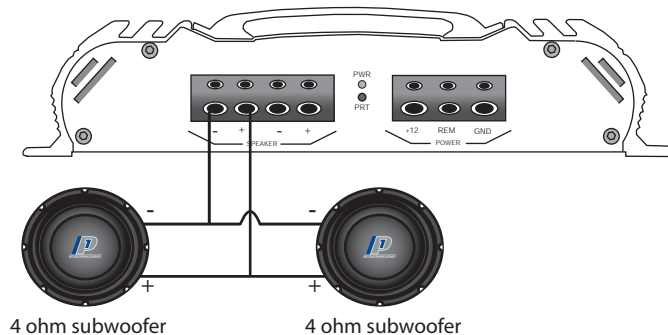
## IMPORTANT

Please read all instructions before installation!

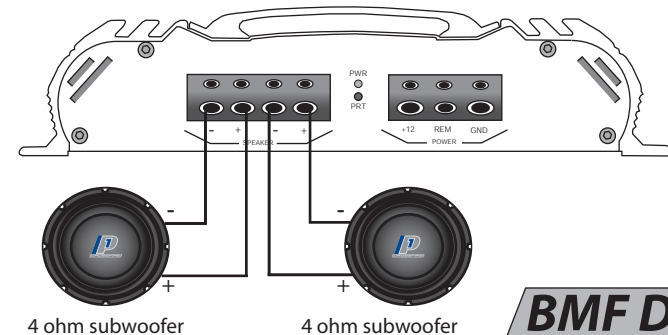
The quality of installation may affect the performance and reliability of your Crossfire product. If you have any doubts or questions regarding installation, you may wish to contact your authorized Crossfire dealer. Remember to follow all wire and fuse requirements suggested in this manual. Warranty may void if proper installation technique is not used.

## OPERATION

Both the Crossfire BMF1000D and BMF600D are single channel, dedicated subwoofer amplifiers. Unlike other Crossfire BMF amplifiers, both these amplifiers operate as a single channel, therefore one amplifier cannot be bridged by itself. Do not be fooled by the two sets of speaker outputs. Two outputs are provided strictly for convenience and are paralleled internally on the circuit board of the amplifier. This means that if both outputs are used with one driver each, the amplifier sees the same load as if the same two drivers are connected to only one output terminal.



In both diagrams, the amplifier sees a 2 ohm load



**BMF D AMPS**



## POWER WIRE & FUSE

The proper wire size is very important for an amplifier capable of these power levels. The following are the recommended fuse values and wire gauge for lengths up to 20ft.

Model	Wire	Fuse
BMF1000D	4awg.	100amp
BMF600D	8awg.	60amp

## POWER

Power wire needs be connected directly to the battery using the wire requirements listed above. Never use the fuse box or any other wire as a source for the power for an amplifier. Before you start, choose the easiest path to run the wire from the battery to the amplifier. Generally, try to keep the power wire on the driver's side of the vehicle (See Signal Inputs & Outputs for explanation). Use the following rules for running the power cable through the vehicle:

1. Use grommets when passing the power wire through any metal wall of the vehicle.
2. Avoid sharp corners or sharp body parts that may easily cut through the insulation on the wire.
3. Avoid running the power wire over engine components and near heater cores.
4. Avoid the gas, brake and clutch pedals and their mechanisms.
5. Use an inline fuse to eliminate the risk of a fire caused by a short in your power wire.
6. Connect the fuse holder as close to the battery positive as possible.

Once the wire has been run, connect the wire to the battery terminal. As a precaution, leave the fuse out until all other wire connections are made.

## GROUND

The wire used for ground should be of the same gauge as the power wire. Just make sure that you choose a different color (generally black) so that you don't reverse the polarity at the amplifier terminals. Follow the rules below for connecting the ground wire properly:

1. Avoid using seat bolts, seatbelt bolts, and fender wells for ground.
2. Choose a metal area close to the amplifier that appears to be a good of ground, such as the floor.
3. Investigate the area you wish to use for electrical wires, vacuum lines, and brake or fuel lines.

Please note that if you are installing multiple high power amplifiers into the vehicle, you must upgrade the ground strap from the battery to the frame and the frame to the body.

### Directions:

1. Find a nut and bolt to fit the ring terminal you have chosen.
2. Drill a hole just large enough for the bolt to fit through at the source of ground.
3. Use either a wire brush or sandpaper to eliminate unwanted paint around the hole you have drilled as to supply a better contact for your ground.
4. Terminate the ground wire to the ring terminal and attach it to the bare metal using the nut and bolt. It is very important for this connection to be solid.
5. Spread silicon over the screw and bare metal to prevent rust and possible water leaks.

## REMOTE TURN-ON

In between the power and ground of the amplifier is a remote turn-on terminal. This terminal must be connected to a switched +12 volt source to make the amplifier operational. Typically, remote turn-on leads are provided at the head unit that will turn on and off the amplifier in correspondence with the source. This means you will most likely have to remove the head unit from the dash to find the source +12V output wire.

Once the head unit is pulled from the dash, locate the remote turn on wire. The majority of vehicles will be using an after market head unit when using an amplifier. These after market head units generally use a blue or a blue with white wire as the remote turn on for the amplifiers. However, when using a factory radio, the power antenna wire should be as a turn on lead if applicable (colors will vary from make/model). Only if a lead is not available at the source, a switched +12 volt supply, such as a toggle switch, should be applied.

Use a minimum of 18-gauge wire, preferably blue, to connect the amplifier to the head unit. If possible, route this wire along side of the power wire using the same precautions. Connect the remote output of the head unit to the wire using a barrel connector or a mating terminal as required by the source unit. You can solder these wires together, but be sure to use heat-shrink over the connection. Do not place the radio back into the dash yet.

## SPEAKER OUTPUTS

### WIRING

Due to the power output and the low frequency bandwidth of the Class "D" amplifiers, Crossfire recommends using a minimum of high quality 12 gauge speaker wire. Consult your local dealer for their recommendations.

As with the power wires, use caution around sharp corners or body parts that may easily cut through the insulation on the wire. To connect the wire to the speaker, strip off approximately ½" (12mm) of the insulation and terminate the wires using insulated speaker terminals (not supplied) or by soldering the connection to the loudspeaker. Be sure that the polarity at the loudspeaker is correct.

## CONNECTING THE WIRES

At this point, the power, ground, remote and speaker wires should be run to the general location of where the amplifier is to be mounted. If the wires are to be hidden under the carpet, you now need to cut a slit for them to come through. To do this, place the amplifier in the location it is to be mounted to verify where the cuts need to be made. Make sure that there will be not be a conflict with the mounting of the amplifier and the wires. Pull the wires through the slit to the terminals leaving approximately 6" (150mm) of slack and cut the wires to an equal length. Strip off approximately ½" (12mm) of insulation from each wire. Insert the wires directly into the terminal and tighten the set screw using a 3mm allen key. Make sure you have the polarity correct on both the power wires and the speaker wires. Check your connections by giving the wires a slight tug.

## SIGNAL INPUTS

Getting a clear signal from the head unit to the amplifier is very important. To achieve this, the proper signal cables must be used. Estimate the length of the cables necessary. Take note that the cable manufacturers will probably not be the exact length necessary for your vehicle. If you are between sizes, purchase the longer cable. You can always hide the extra wire.

Be aware off the differences in cable. Better RCA's usually have multiple layers of shielding and/or twisted pair wiring for better noise rejection. Consult your local dealer for their recommendations.

### LINE LEVEL INPUTS

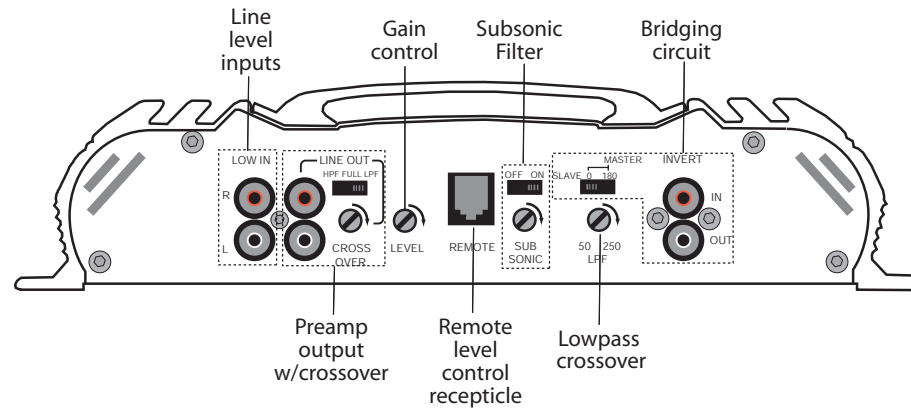
Car environments are notorious for poorly insulated wires. This means that hiss, engine noise, and fan noise can easily be picked up through RCA cables if ran incorrectly. To avoid picking up noise, run the RCA's away from large wire looms and electric fans if possible. And always make sure to position your patch cables away from the power wire, preferably on the opposite side of the vehicle. As with the power wire, use caution around sharp corners of body parts that may easily cut through the cables.

Located on the opposite side of the power terminals are three sets of line level (RCA) receptacles. Marked "LOW IN", these receptacles accept signal from the outputs of the source unit via RCA patch cables. When connecting the signal cables, be sure the balance (left and right) stays consistent between the amplifier and head unit. The cables should be marked for easy installation: red is right and black or white is left.

Once you have finished connecting the signal cables to the source unit, slide the head unit back into the dash location. Make sure that the head unit is in securely.

## PEAMP FEATURES

The Crossfire BMF600D and BMF1000D have a tremendously powerful preamp section located on the panel opposite the power terminals. Included in this preamp section are Lowpass Crossover for the amplifier, a switchable/variable Subsonic Filter, Preamp Output with Variable Crossover, a Digital Remote Level Control, and a built in Bridging Module. These features can be used to improve your system quality as well as make the amplifiers easier to use on a day to day basis. Please read the following instructions carefully.



### LOWPASS CROSSOVER

Locate the rotary dial marked LPF. This is the LowPass Filter (crossover) for the amplifier. The lowpass crossover points are fully variable from 50Hz to 250Hz making them ideal for subwoofers. Adjust this dial either to the recommended crossover frequency for the subwoofer or, more importantly, to a level where the subwoofer blends well with the midrange.

\*Note: Due to the limited frequency range of these Class D amplifiers, the crossover is always active.

### SUBSONIC FILTER

The subsonic filter is used to reduce the amount of low frequency harmonics and/or subsonic noise picked up in audio systems. Both of these can be damaging to subwoofer and possibly the amplifier. As well, harmonics and subsonic noise can cause the amplifier to pull excess power from your electrical system.

The subsonic filter on the BMF600D/1000D is selectable, ON/OFF, and variable from 20Hz to 50Hz. We make this switchable ON/OFF, for every system is different. For most people it is desirable to have the filter on. However, if you have an outright SPL system, it may be beneficial to remove the subsonic filter because harmonics can actually increase the sound pressure in many cases.

So what frequency should you set the subsonic at? For most applications it is desirable to leave this between 20Hz and 30Hz. If you are using a ported enclosure designed for SPL, yet you are using the system on a daily basis, a higher filter frequency may be desired. This will allow the enclosure to be tuned higher and reduce the chance of the woofer to becoming non-linear and destroying itself.

### REMOTE LEVEL CONTROL

Optional to the BMF600D/1000D is the digital remote level control. This level control can be mounted in an area within reach from the driver's seat and can be used to raise and lower the output level of the amplifier to the desired level. To connect this, run the provided cable from the remote to the amplifier. Plug the cable into the receptacle on the preamp section of the amplifier marked "REMOTE". The remote control receives power directly from the amplifier so no extra wires need to be connected.

### LINE LEVEL OUTPUTS

The line level output is to be used as an easy solution to link multiple amplifiers together without the use of problematic RCA y-cables. The signal is buffered so that there is no loss. Please note that the signal passing through these outputs is not affected by the gain control of the amplifier.

Included in the circuit of the line level output is an electronic crossover variable from 50Hz to 250Hz. This crossover is switchable from highpass, lowpass, and full range. This allows the stereo system to remain flexible enough to be arranged in a numerous amount of ways. Please refer to the diagrams at the end of this section for suggestions.



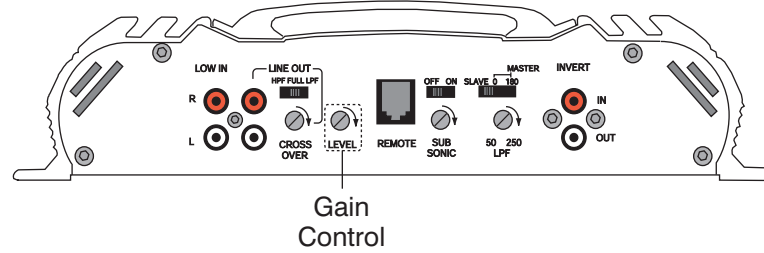


## GAIN CONTROL

Located in the preamp section on the side panel of the amplifier is the gain control (marked level). This control allows you to match the input level of the amplifier to the output level of your source unit or signal processor. Matching the input can be accomplished in three simple steps:

1. Turn gain control all the way down.
2. Turn on the source unit and adjust to 2/3 of max volume.
3. Adjust the gain control until desired volume is achieved without audible distortion

Remember that the gain control is not a volume knob. Ignoring the three steps above may leave you with damaged speakers and possibly a damaged amplifier.



If you are bridging the two BMF600D or BMF1000D's together, only the gain control on the "Master" amplifier is adjustable. Use the same three steps to adjust the gain.

## POWER AND PROTECTION

On the power and speaker panel of the amplifier are two LED's. These LED's indicate either power "on" or protection modes.

**Green LED:** This LED illuminates when the amplifier is powered up indicating normal operation.

**Red LED:** This LED illuminates when the amplifier goes into protection. This indicates a problem with the system in relation to the amplifier connected to it.

## SYSTEM EXAMPLES

